

SURVEY REPORT:

LEAD PAINT AND ASBESTOS CONTAINING MATERIALS ASSESSMENT FOR THE PLUM ISLAND LIGHTHOUSE

**PLUM ISLAND ANIMAL DISEASE CENTER
PLUM ISLAND, NEW YORK**

Prepared for:

U.S. Department of Homeland Security
Science and Technology Directorate
Office of Research and Development
Plum Island Animal Disease Center
Plum Island, New York

Prepared by:

BMT Entech, Inc.
13755 Sunrise Valley Drive, Suite 320
Herndon, Virginia 20171

February 2008



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Survey Report: Lead Paint and Asbestos Containing Materials Assessment for the Plum Island Lighthouse Plum Island, New York

PURPOSE

The purpose of this Survey Report (Report) is to document observational and analytical findings associated with a lead paint and asbestos containing material (ACM) investigation of the Plum Island Lighthouse (Lighthouse). A narrative describing the observational details of the survey, the locations of sample collection sites, and a presentation analytical data results, is provided in the body of this Report. Photographs illustrating conditions encountered within the structure are also provided for documentation purposes.

SITE BACKGROUND

The Lighthouse is located on a bluff along the western edge of Plum Island, Suffolk County, New York. A navigational aide has been located on this site since 1826 when the Federal Government purchased approximately three acres on the northwestern tip of Plum Island to create this Federal reservation. The present-day Lighthouse was constructed in 1869 and is currently the oldest navigational structure in this locale (an active, automated light is presently housed on a pipe-frame structure immediately north of the Lighthouse). Until it was deactivated and replaced by an automated light in 1978, the Plum Island Lighthouse was manned and maintained by the U.S. Coast Guard. Crews lived and worked in the structure and maintained the fourth order Fresnel lens in the Lighthouse tower's Lantern Room. Two adjacent structures (the Oil House and Storage Shed [Garage]) were also part of the Coast Guard reservation. Due to shoreline erosion of the bluff, the Lighthouse reservation had decreased to less than two acres in size by its closing.

Between 1954 and 2003, the balance of Plum Island was owned and occupied by the United States Department of Agriculture/Agricultural Research Service (USDA/ARS). USDA/ARS operated the Plum Island Animal Disease Center (PIADC), a disease diagnostic research center, during that period. When the US Coast Guard deactivated its Plum Island reservation in 1978, ownership of the property and its structures were transferred to PIADC. The structures remained unused and minimally maintained by PIADC for the next 25 years. In 2003, Plum Island and the PIADC facilities were transferred from USDA/ARS control to the U.S. Department of Homeland Security (DHS). Conveyance of all real property, including the former Lighthouse and its support buildings, occurred at that time. As was the case during USDA/ARS's tenure, no operational use of the abandoned Lighthouse facilities has occurred since DHS assumed control of the island.

In 2007, PIADC's management team expressed general interest in stabilizing the interior of the building to permit future visits to the Lighthouse by invited guests. This survey was undertaken to assess the general condition of the structure and its potential for harboring lead paint and possible ACM. Samples of

materials thought to contain or be comprised of these hazardous substances were collected for laboratory analysis. The analytical data generated by this survey can be used by the management team to determine whether reasonable removal/remedial actions can be taken to correct potential health and safety concerns within the structure.

SURVEY OVERVIEW

The survey was conducted on January 16, 2008 and was completed in a single day. The survey was conducted by Mr. Thomas Dwyer, PIADC's Environmental Protection Specialist, and Mr. Steve Baker, an Environmental Consultant with BMT Entech, Inc. A general visual site inspection of the Lighthouse was initially undertaken to assess the overall condition and potential physical safety hazards posed by the structure. Each of the rooms within the six story Lighthouse were evaluated for their overall structural condition, potential for harboring leaded paint and possible ACM, and for representative sample locations. Measurements of each room were also taken for future cost estimating and reference purposes (see Appendix A for scaled building schematics for each floor). This cursory inspection was strictly limited to a visual surveillance action; no invasive sampling or disruption of structural elements within the building was undertaken at that point. The general utility of each floor of the building during the years prior to its abandonment is briefly described below. Figure 1 provides a structural schematic view of the individual floors of the Lighthouse.

Basement – The hot water heating system for the building was located on this lowest level of the building. A small workshop and mechanical parts storage area/room was also located in this area. Other open areas of the basement were presumably available for general storage purposes.

First Floor - This floor provided crews with common recreational and general support facilities. Kitchen and restroom facilities are found on this floor, as is a general supply pantry. The two largest rooms, one of which still contains a commercial-grade pool table, was likely used for recreational purposes.

Second Floor - The second floor was primarily used for sleeping quarters. A small office located on the south side of the structure (overlooking Plum Gut) was used for administrative and ship monitoring purposes.

Attic – This unfinished portion of the Lighthouse was probably used for general storage. A hand made chin-up bar and bench press for free weights is still present in this space. This equipment suggests that crew also used this area for physical training (PT) purposes.

Service Room - This small, octagonal-shaped room is located in the central body of the Lighthouse's tower. This room appears to have housed electrical services associated with the operation of the navigational aid(s). This room also provided access to the uppermost level of the Lighthouse.

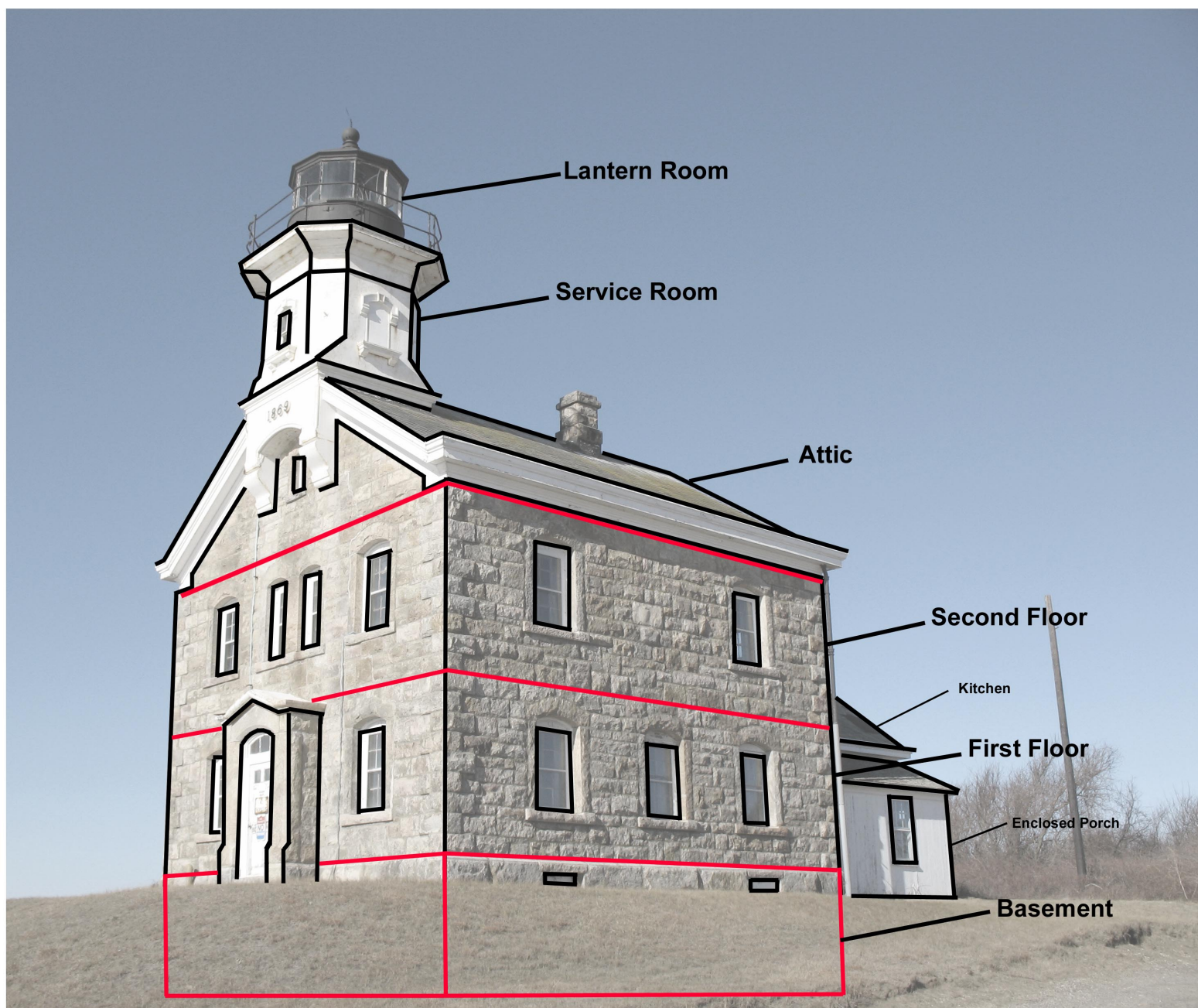


Figure 1- Plum Island Lighthouse Building Schematic

Lantern Room – This round, half-walled, cast iron structure housed the Fresnel lens and its operational appurtenances. All navigational equipment has been removed for preservation purposes. Large windows set atop the Room's waist-high metal wall provides a 360-degree view of Plum Island's maritime surrounds. A bell-shaped cast iron roof encloses the Lantern Room from the elements.

Visual Site Inspection Observations - The overall condition of the Lighthouse was surprisingly good. The structure appeared to be watertight and showed no obvious signs of damage from roof leaks or deteriorated window/door seals. In those areas where the original lathe and plaster ceilings and floors were present, the condition of these finishing materials was generally good. In some instances, fallen or broken plaster and lathe were visible; however, the cause of this damage was not immediately clear. No evidence or any structural insulating materials within walls or between floors was observed.

Numerous examples of 20th Century modifications (1960s or 1970s -era improvements) to the interior of the Lighthouse were also evident during the inspection. Many of the sleeping quarters (bedrooms) and first floor common areas of the building were covered with wood veneer wall panels that had been nailed directly to the original plaster walls. These panels were largely intact and serviceable; they would not necessarily need to be replaced unless complete restoration of the structure was desired. Flooring in the form of "linoleum" tiles – the actual composition of the tiles was unclear - was present throughout most of the structure. The tiles were presumably laid atop the building's original wooden floors. Many sections of these tiles have deteriorated over time and would need to be removed and possibly replaced. No visual or physical evidence of weak or flexing underlayment, sure signs of floorboard and/or floor joist deterioration, was noted.

Ceilings within the building were also a mix of new and old material. Many of the original lathe and plaster ceilings were still intact, however, fallen plaster was noted in the eastern bedroom on the second floor and in the Entry Hall and Kitchen on the first floor. Drop/false ceilings located on the first floor were generally found in all rooms on this level of the Lighthouse. In some instances, these ceilings had collapsed (or had been purposely removed); other rooms continued to host intact ceiling systems. Removal of these remaining drop/false ceiling systems (i.e., tiles and structural support members) would ensure future safe passage throughout the building.

In addition to the drop ceiling systems found on the first floor, presumably older, acoustical ceiling tiles were observed also noted on this level of the Lighthouse. These tiles appeared to have been bonded to the original lathe and plaster ceilings of the structure and, where visible, appeared to be in generally good condition. The presence of these tiles may actually have helped to strengthen and support areas of the original lathe and plaster ceiling where delamination may be occurring.

No furnishings of note, other than a commercial-quality pool table that had been abandoned in place in the first floor Recreation Room, were present in the building. The lack of furnishings and deteriorated drop/false ceiling systems suggest that a past, wholesale removal/clean-out of abandoned items within the building likely occurred at some point. This removal activity is thought to have happened during USDA/ARS's tenure on the island; no work on the interior of the building has reportedly occurred since DHS assumed ownership of PIADC.

The attic was found to be unfinished with its original wooden floorboards. No painted surface or evidence of insulation or any kind was observed in this walk-in portion of the building. The small, octagonal-shaped Service Room found on the next level up was covered in white painted wood paneling. No insulating materials were noted. Deteriorating black floor tiles were present on the floor of this room. The Service Room is situated in the main body of the tower.

The highest and final level of the Lighthouse is the Lantern Room. This cast iron, half-walled, half glass chamber was generally in good condition. The floor was of metal plate construction. The window panes were found to be intact; however, many cracks in the glass were noted. All cracks appeared to have been sealed with silicon caulk to prevent the intrusion of outside moisture. The bell-shaped ceiling of the Lantern Room exhibited pronounced paint deterioration. No insulating materials were noted in this chamber.

The Basement was the final area of the Lighthouse to be inspected. This unimproved area held the building's heating system (hot water registers were used to heat individual rooms in the Lighthouse) and most of the initial trunk line water supply pipes. ACM pipe insulation, most of which was in bad condition, was (or once was) wrapped around the water supply pipes. Friable asbestos debris was present on the floors. No evidence of wet floors or water stained masonry walls was detected, suggesting that the sub-grade wall and foundation are watertight. White wall paint that had once covered this masonry work had generally fallen away and now lies on the basement's concrete floor.

Although the Lighthouse appears structurally sound, the interior of the building is distressed aesthetically. The lack of temperature and humidity control and the general neglect of interior maintenance since the Lighthouse was abandoned in 1978, has caused nearly all painted surfaces to crack and peel over time. Additionally, deterioration of exposed plaster base materials and surface skim coatings on the walls and ceilings has occurred in several areas. This damage, fortunately, is spatially limited and could be repaired. Removal of this paint and plaster debris would greatly improve the unkempt appearance of the structure; however, respiratory hazards must first be thoroughly considered. Given the age of the structure and the likelihood that lead dust from deteriorating paint and asbestos fibers from various insulating and structural materials are present, evaluations of these potential threats must first be considered. The balance of this survey addresses these potential concerns.

Lead Paint Evaluations - Rather than sample each of the several, individual rooms within the Lighthouse, the survey team elected to collect paint chips for various structural elements that were representative or common to the structure as a whole. These representative structures included window frames, ceilings and walls, stairwell banisters, and wood floor and trim moldings. Additionally, where different colors or apparent ages of paint were observed, regardless of surface, a representative sample of these unique surface coatings were also collected. The specific locations of the several paint samples (e.g., Pb #X) are portrayed in the floor plans presented in Appendix A. A presentation of the original summary data generated by the analytical laboratory is provided in Appendix B. Photographs of each sample location/painted surface are included in the final Appendix of this Report. A description of each sample and its reason for being collected are presented on a sample-by-sample basis below.

Pb Paint Sample #1: Paint and skimcoat plaster from the peeling kitchen ceiling was collected for analysis (Photo 1). This sample was collected to be representative of rooms with painted, non-tiled ceilings. Analytical results reveal that lead was present in the sample collected. The concentration of lead was reported at 80,000 ppm (8.0 percent).

Pb Paint Sample #2: This sample was collected from a first floor window frame and was selected to be representative of all window systems in the building (Photo 2). The paint was white in color and many layers thick. The appearance and condition of the paint was visually identical to that of all windows inspected within the structure. Analytical results reveal that lead was present in the sample collected. The concentration of lead was reported at 1700 ppm (0.17 percent).

Pb Paint Sample #3: Sample #3 was collected from the Entry Hall of the first floor, which is located adjacent to the formal entrance to the Lighthouse. Unlike most of the common areas of the first floor, hall walls and stairwells on all floors were not covered with wood veneer paneling. Large sheets of paint were found peeling from the plaster surface; paint fragments littered the floor as a result (Photo 3). Close examination of the paint and wall surfaces in the Entry Hall revealed at least seven different layers of distinctly colored paint. Working up from what appears to have been the earliest base coat paint layer, the following colors were observed: plaster white, black, dark grey, carmel, creamy yellow, pastel yellow, and blue green. The outer (most recent) blue green color was the most common wall covering color observed throughout the first and second floors of the Lighthouse. This color was also, in cases where it could be observed, found behind the wood veneer paneling. A representative sample of this multi-layer paint was collected for analysis because of its multiple paint layers. Analytical results reveal that lead was present in the sample collected. The concentration of lead was reported at 71,000 ppm (7.1 percent).

Pb Paint Sample #4: This sample was collected from the large sheets of robin egg blue paint found peeling from the walls in the first floor storage room (Photo 4). This blue paint, which differed in color

from other blue or blue-green paints observed within the Lighthouse, was collected solely because of its unique coloration. No underlying colors (paint layers) were noted in field notes created during the survey. Analytical results reveal that lead was present in the sample collected. The concentration of lead was reported at 80,000 ppm (8.0 percent).

Pb Paint Sample #5: A sample of the bright blue wall paint observed in the Kitchen between the former drop/false ceiling system and the original plaster and lathe ceiling, was collected for analysis (Photo 5). This blue paint, which differed in color from other blue or blue-green paints observed during the survey, was collected because of its unique coloration. No underlying colors (paint layers) were noted in field notes created during the survey. Analytical results reveal that lead was present in the sample collected. The concentration of lead was reported at 78,000 ppm (7.8 percent).

Pb Paint Sample #6: A sample of blue-green paint recovered from behind a wood veneer panel that had fallen away from the original lathe and plaster walls. This particular sample was obtained from the East Bedroom of the second floor (Photo 6). This paint color appeared somewhat different from the blue-green color that appears prominently throughout most of the Lighthouse. This difference in color/tone may be attributable to its having been protected from light, dirt, and general exposure, by the paneling. This sample was considered to be representative of wall paint likely found behind all paneling on the second floor. Analytical results reveal that lead was present in the sample collected. The concentration of lead was reported at 70,000 ppm (7.0 percent).

Pb Paint Sample #7: Paint scrapings were collected from the wide baseboard trim found in the hall and stairwell of the second floor. This black trim paint was unique and was not found on any other surfaces within the structure. The paint was generally in good condition and exhibited only moderate peeling (Photo 7). No underlying colors of paint were noted in association with the sample collected. Analytical results reveal that lead was present in the sample collected. The concentration of lead was reported at 79,000 ppm (7.9 percent).

Pb Paint Sample #8: Bright blue trim paint found around door and window frames in the small, West Bedroom on the second floor was collected for analysis (Photo 8). This paint color was also unusual and appeared nowhere else in the building. Older, underlying layers of white paint were also associated with the blue paint chips collected from this room. Analytical results reveal that lead was present in the sample collected. The concentration of lead was reported at 5,400 ppm (0.54 percent).

Pb Paint Sample #9: Peeling white paint was collected from the plank board paneling found within the Service Room (Photo 9). The sample was determined to be representative of all wall surfaces in this room. Analytical results reveal that lead was present in the sample collected. The concentration of lead was reported at 85,000 ppm (8.5 percent).

Pb Paint Sample #10: Peeling white paint from the metallic, bell-shaped ceiling of the Lantern Room was obtained for analysis (Photo 10). This paint sample was considered to be representative of all painted, metallic surfaces in this cast iron structure. While the paint and underlying metal surface of the collection site was significantly deteriorated, surficial conditions elsewhere in this circular room much less pronounced. Analytical results reveal that lead was present in the sample collected. The concentration of lead was reported at 91,000 ppm (9.1 percent).

Pb Paint Sample #11: Grey paint was collected from wooden banister and stairway tread surfaces found in the stairwells leading to the Attic, Service Room, and Lantern Room (Photo 11). The paint sample collected appeared to be representative of all staircase woodwork in these areas. Analytical results reveal that lead was present in the sample collected. The concentration of lead was reported at 82,000 ppm (8.2 percent).

ACM Evaluations – The survey team also selected several common structural finishing materials within the Lighthouse for possible asbestos content. The items selected were determined to be representative of materials found throughout the structure and, based on a prior literature search of the ACM topic, determined to likely contain some level of asbestos content. Given the age of the structure, ACM was suspected to be present in a variety of items. Examples of suspect materials included floor tiles, tile mastic, ceiling tiles, and pipe insulation. Other materials, such as the ceiling and wall plaster and roofing shingles, were also sampled based on visually identifiable fibers in their sample matrix. All samples were submitted to an analytical laboratory for examination via polarized light microscopy (PLM) techniques. Asbestos content values, where and when detected, is presented on an area percentage basis.

The specific locations of the several ACM samples (e.g. ACM #X) are portrayed in the floor plans presented in Appendix A. A complete presentation of the asbestos data results provided by the analytical laboratory is provided in Appendix C. Photographs of each of the materials sampled are included in the final Appendix of this Report. A description of each sample and the reason for its collection is presented on a sample-by-sample basis below.

ACM Sample #1: A sample of the black, 9 x 9-inch floor tiles common to most floors within the building was selected for analysis (Photo 12). The sample was comprised of both the tile and the underlying black, tar-like mastic that originally held it in place. Both the tile and the mastic were evaluated. The

analysis revealed chrysotile asbestos in both the tile and mastic. The concentration, by area, of asbestos in each sample was between 1 and 3 percent and 3 and 5 percent, respectively.

ACM Sample #2: This sample was collected from the red tile floor found in the Office on the second floor (Photo 13). These tiles were also 9 x 9 inches in size. Black mastic visually identical to the black tile selected in Sample #1 above was also present on the back of the sample selected. Once again, both the tile and the mastic were evaluated. The analysis revealed chrysotile asbestos in both the tile and mastic. The concentration of asbestos in each sample was determined to be between 1 and 3 percent, by area.

ACM Sample #3: Sample #3 was collected from a collapsed drop/false ceiling tile found in the second floor Office (Photo 14). This tile appeared to be of the same construction as those intact tiles on the first floor of the Lighthouse. The analysis of this material revealed that it was comprised of fiberglass and contained no detectable amounts of asbestiform minerals.

ACM Sample #4: A sample of the deteriorated plaster ceiling in the East Bedroom on the second floor was collected for analysis (Photo 15). The analysis of this materials indicated that fibrous materials in the in the plaster matrix were comprised of cellulose (between 10 and 20 percent, by area). No detectable amounts of asbestiform minerals were present.

ACM Sample #5: A sample of the light green, 12 x 12-inch floor tile present on the floor of the Bathroom on the first floor was collected for analysis (no photo available). The tan-colored mastic present on the back of the tile sample was also evaluated. The analysis of both tile and mastic revealed that chrysotile asbestos was present between 1 and 3 percent, by area, in the matrix of the tile; no detectable asbestiform mineral content was noted in the mastic. Fibers present in the mastic were determined to be composed of cellulose materials.

ACM Sample #6: Sample #6 was obtained from the damaged plaster wall in the stairwell between the first and second floor (Photo 16). Fibers appeared to be present in this damaged material, so a small piece of the wall was collected for further analysis. The laboratory determined that the sample was comprised of the two distinct layers or "phases": plaster and skimcoat. The analytical results of this analysis revealed a trace amount (<1%) of chrysotile asbestos in the plaster; however, no detectable asbestiform mineral content was observed in the skimcoat.

ACM Sample #7: A sample of the acoustical tile glued to the original plaster ceiling on the first floor of the Lighthouse was obtained for analysis (Photo 17). The interior of this sample was very fibrous and was a yellow-orange color. Analysis of the material revealed that is was largely comprised of cellulose (80 to 90 percent, by area). No detectable asbestiform mineral content was noted.

ACM Sample #8: A representative sample of the insulation covering the Basement water pipes was collected for confirmation analysis (Photo 18). This material was visually identified as asbestos by the Survey Team members. The insulation was in very poor condition; much of it had fallen to the floor in pieces. The confirmation sample was identified as chrysotile asbestos, and was reported to contain between 40 and 50 percent, by area, of this asbestiform mineral. Another 30 to 40 percent of other, presumably non-hazardous fibrous materials were reported to be present in the matrix of the insulation.

ACM Sample #9: The final ACM sample collected from the Lighthouse actually came from an exterior structural element of the building (Photo 19). A portion of a broken roofing shingle was collected from the ground on the eastern side of the Lighthouse. The tile was described in field notes as having hard, brittle, ceramic tile-like attributes. The shingle was later characterized in laboratory documentation as transite. Analysis revealed chrysotile asbestos content between 10 and 20 percent, by area, within the shingle sample matrix.

LEAD PAINT AND ACM EVALUATION CONCLUSIONS/RECOMMENDATIONS

The analytical results obtained from both the paint and ACM evaluations indicate that both hazards are present throughout the Lighthouse. The concentrations of lead and asbestos fibers point to an obvious need to initiate some level of surficial wall, ceiling, and floor restoration if any lasting safety and aesthetic improvements to the building are to be realized. The extent of that restoration activity and the level of effort necessary to secure the building are open to debate. Technical input and direction from certified experts in the lead paint and asbestos remediation fields would provide more definitively information regarding costs and manpower necessary to restore the structure's interior spaces. In the interim, the following general conclusions and action recommendations are offered, in the interim, for consideration.

- First and foremost, installing and maintaining some form of climate control for the structure is necessary if structural surfaces are to be secured over the long-term. Most of the deterioration noted within the building is due to high humidity and temperature swings associated with Mid-Atlantic seasonal and marine conditions. Without such a system, constant maintenance would be necessary as new materials break down over much reduced life spans.
- An initial first remediation step in restoring access to the Lighthouse would be to professionally assess exposed and peeling paint surfaces throughout the structure. In those areas where deterioration is generally limited, encapsulation (touch up and repainting) of older painted surfaces with modern, non-lead paint would probably be acceptable. The hallway on the second floor, the wooden steps and hand rails from the second floor to the Lantern Room, the Service Room walls, and the Lantern Room itself might be candidates for this "arresting/encapsulation" action. Since the structure is not used as a residence and only limited, short-term

access is anticipated, future exposure from underlying leaded surfaces that are well maintained would not lead to any measurable exposure hazards.

- Areas where significant peeling is observed would require extensive removal and surface repair to correct structural impacts. These impacts include continued deterioration of the plaster and lathe wall and the drop/false ceiling systems. This activity would be necessary, for example, in the entry hall, supply pantry, and kitchen on the first floor, the main stairwell to the basement, and the stairway between the first and second floor.
- Existing painted wall surfaces located behind wood veneer paneling probably could be left in their present condition. These painted surfaces, where they could be inspected, appeared to be in reasonably good condition due to protection provided by the paneling. Improved temperature and humidity control would likely arrest any unseen deterioration that may be occurring and negate any significant future maintenance requirements to these specific surfaces.
- Asbestos removal is desperately needed in the basement of the structure, regardless of future access to the Lighthouse. Approximately 200 to 300 linear feet of deteriorating asbestos pipe wrap is present in this area. Portions of this insulation have already deteriorated and dropped to the floor. Significant dust and insulation fragments are present throughout this area. Near term removal of this material while most of it is still intact would significantly mitigate future remediation costs and levels of effort.
- Floor tiles and mastics, while shown to contain low percentage asbestos content, need to be removed in any case. All of these floors are brittle, cracked, and lightly adhered to the underlayment. If the tiles were intact, they could be sealed and maintained without hazard. However, due to deterioration caused by temperature, humidity, and time, all such floors need to be removed and replaced for general safety (and appearance) purposes. Once removed (and the interior spaces are cleaned of paint and ACM residues), modern, non-asbestos tiles could be reinstalled. Restoration of the original wooden floors of the building would be significantly more costly (and maintenance intensive) than a replacement tile option.
- Continued vigilance of the condition of the roof is necessary to maintain the overall good condition of the structure. The asbestos content of the existing roof does not pose a hazard as long as its individual tiles are not subject to grinding, cutting, or other abrasive activities. No extraordinary actions regarding the roof appear necessary at this time.

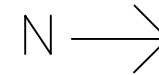
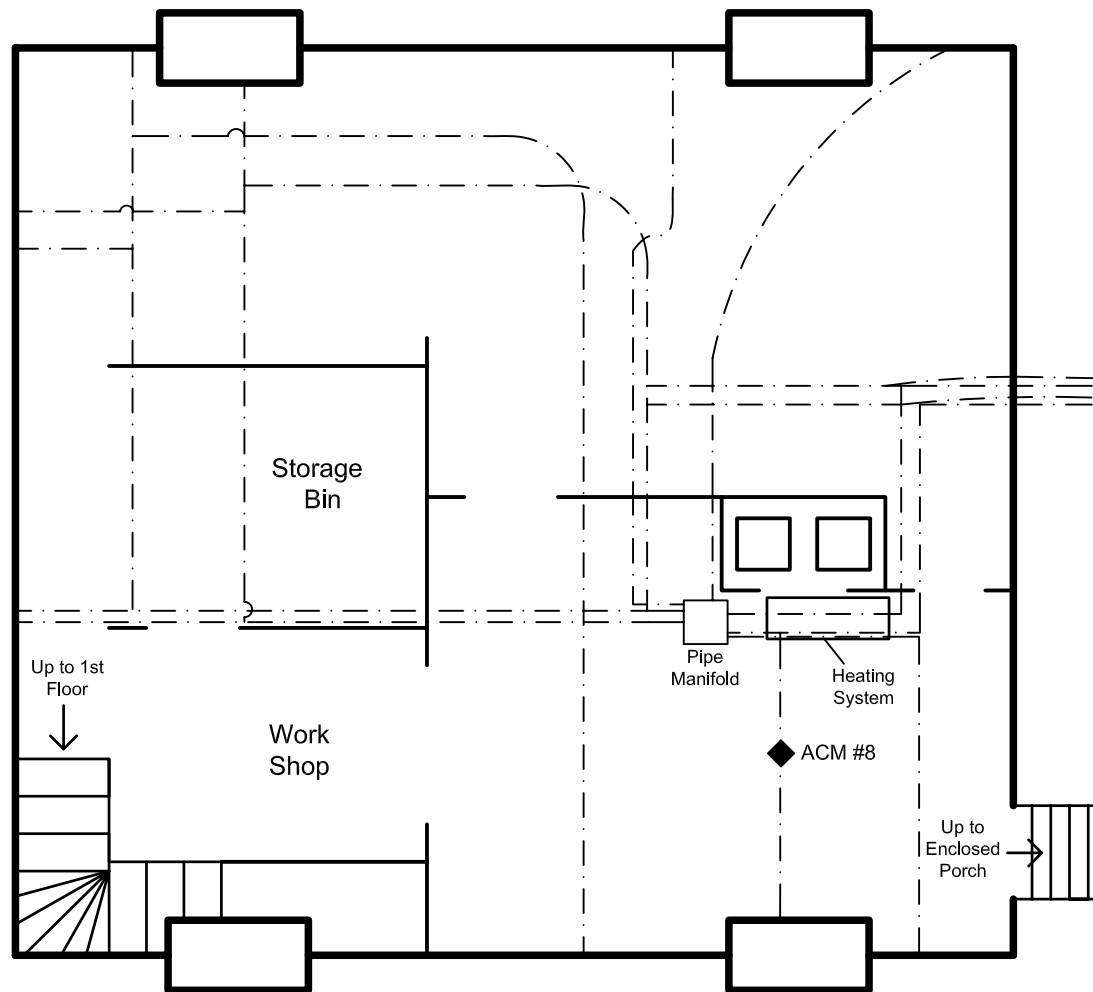
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APPENDIX A

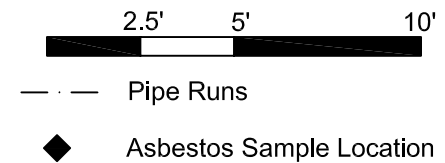
Lighthouse Floor Diagrams and Sampling Locations

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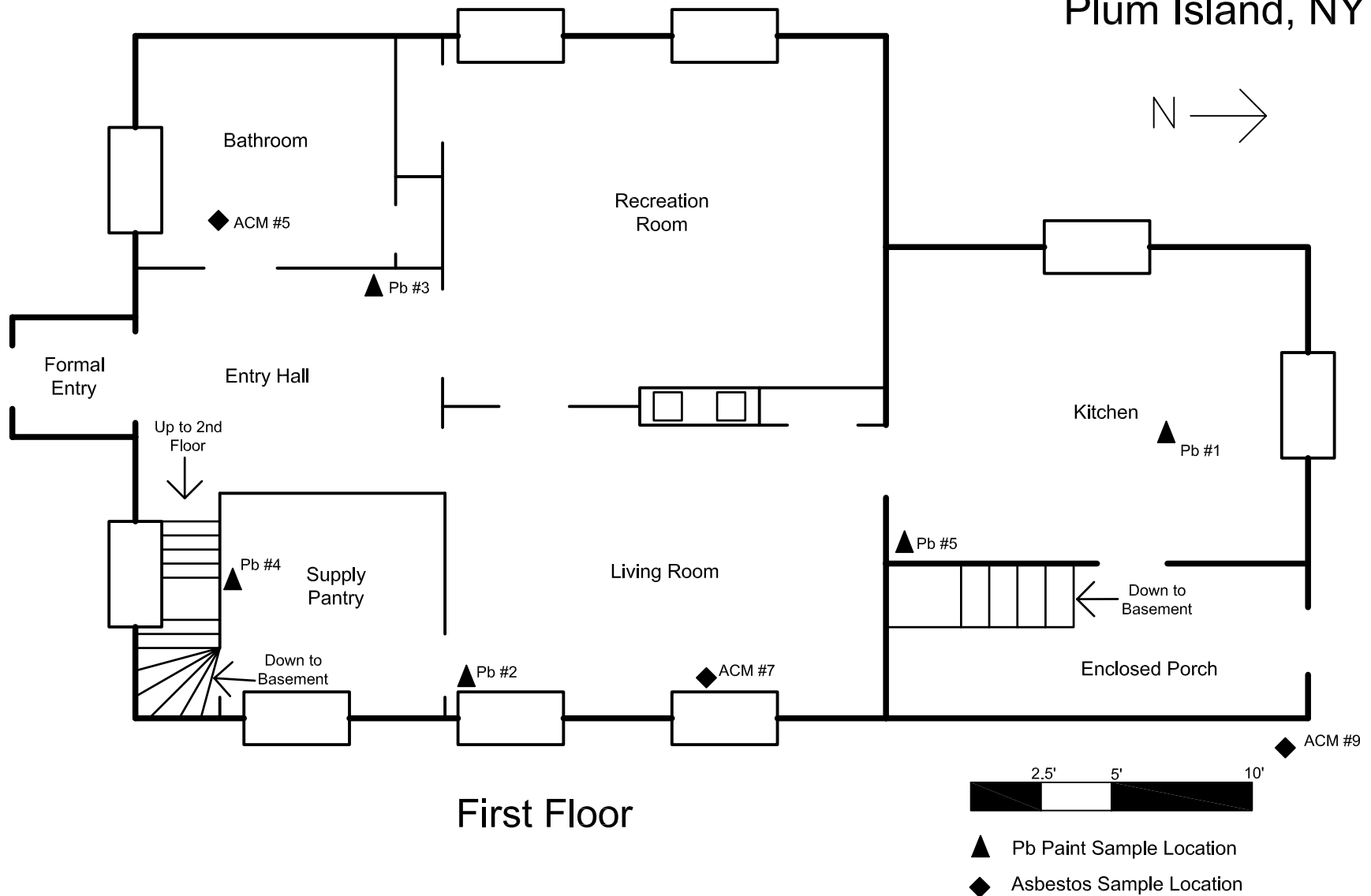
Plum Island Lighthouse Plum Island, NY



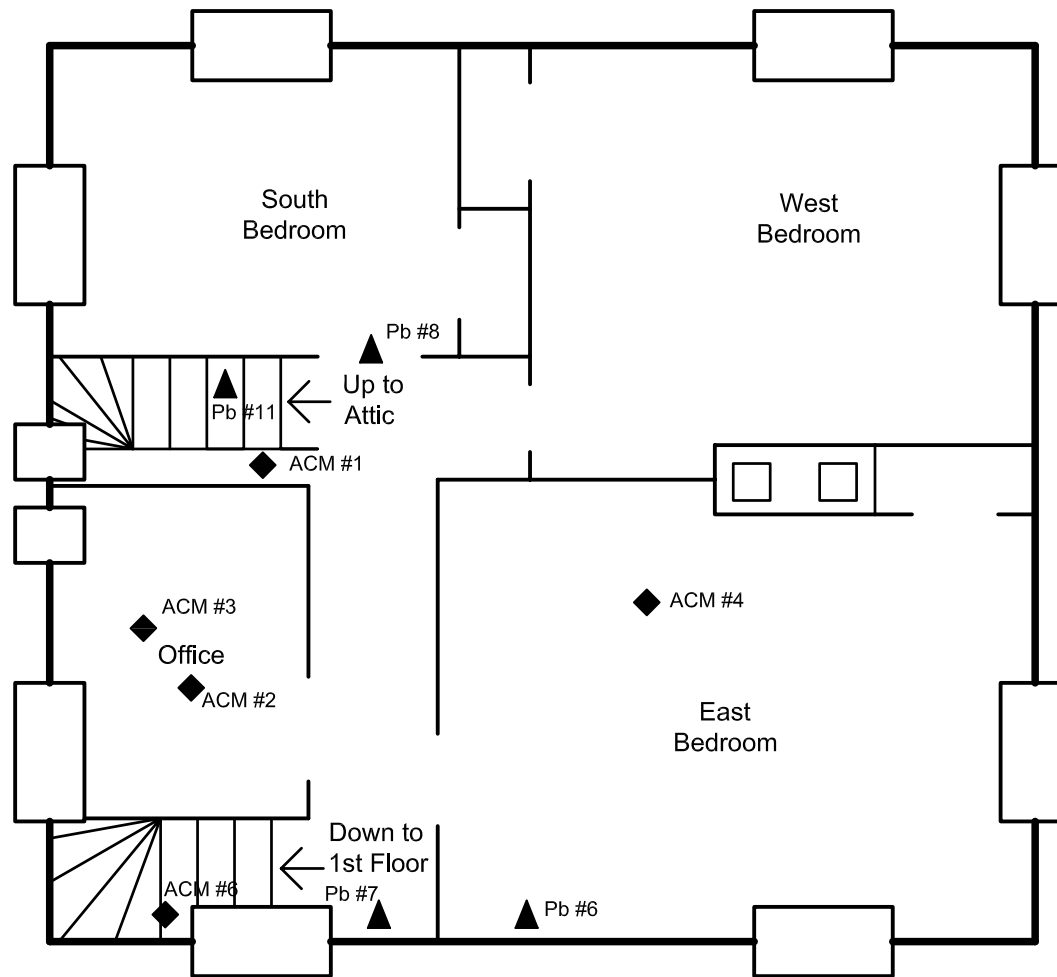
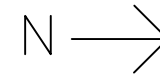
Basement



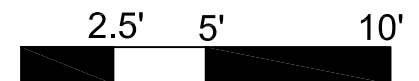
Plum Island Lighthouse Plum Island, NY



Plum Island Lighthouse Plum Island, NY



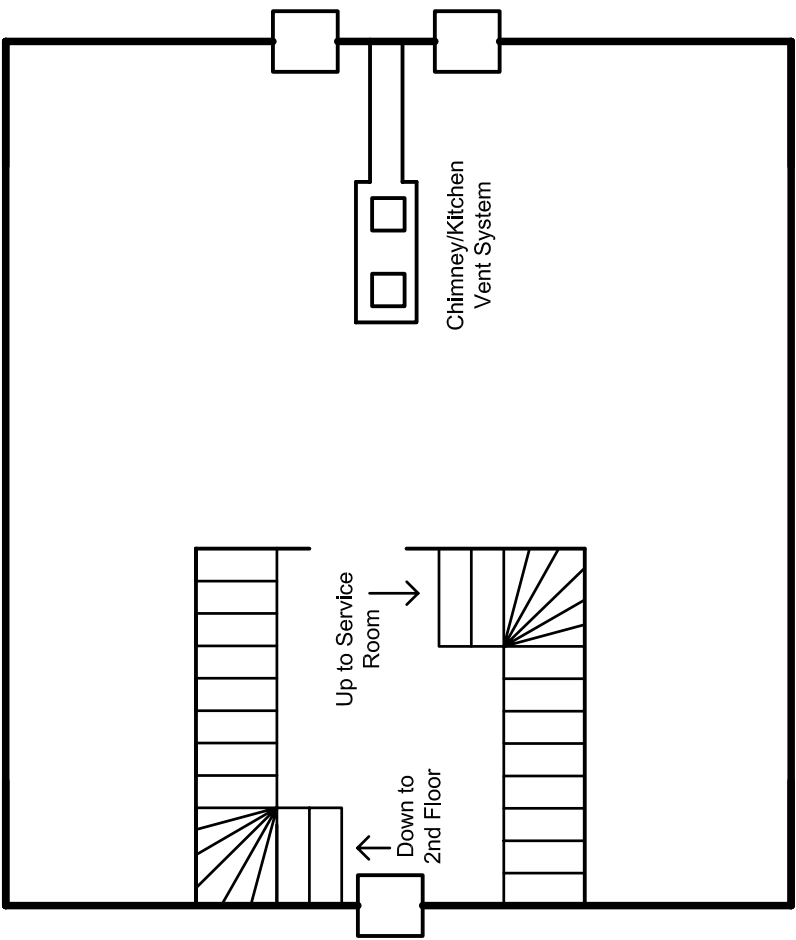
Second Floor



▲ Pb Paint Sample Location

◆ Asbestos Sample Location

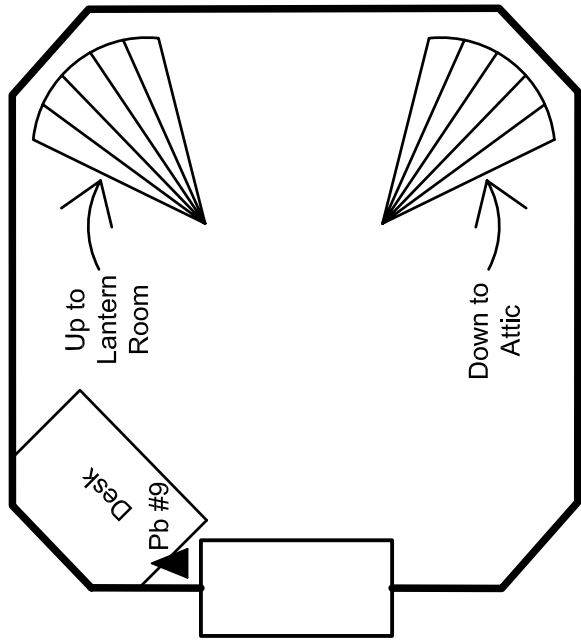
Plum Island Lighthouse
Plum Island, NY



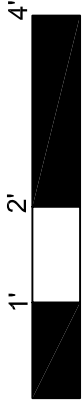
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Plum Island Lighthouse
Plum Island, NY

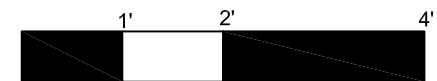
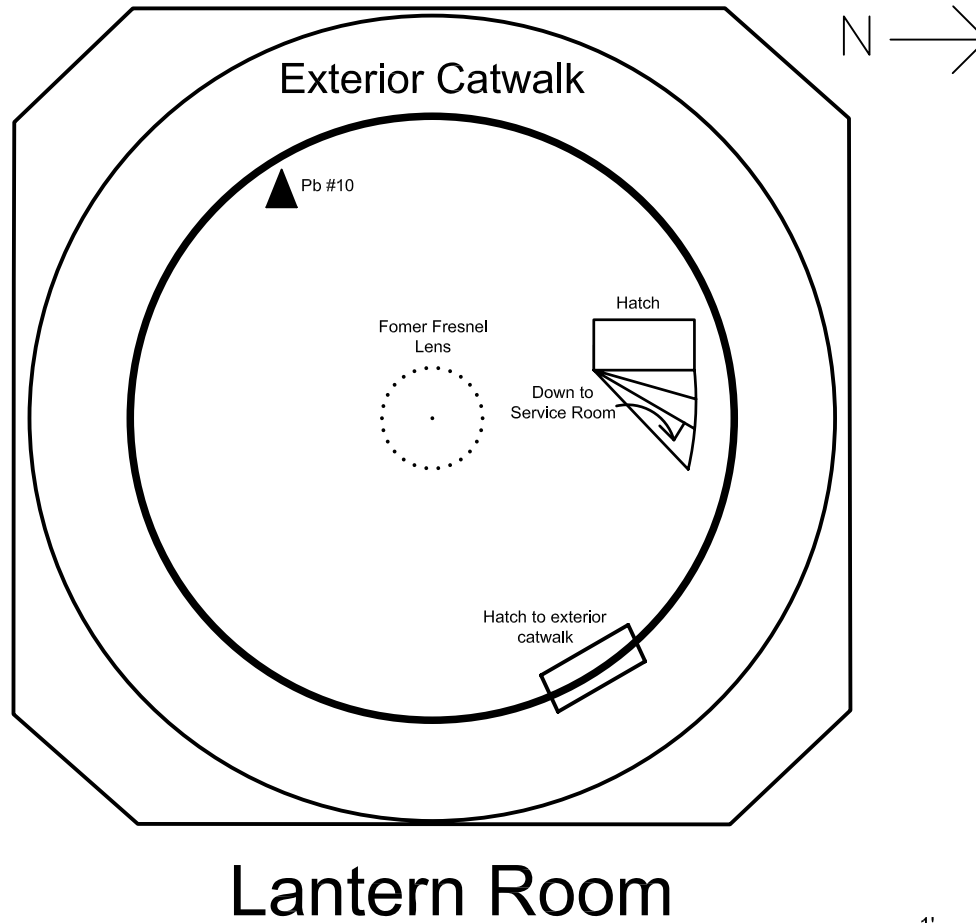


Service Room



▲ Pb Paint Sample Location

Plum Island Lighthouse Plum Island, NY



▲ Pb Paint Sample Location

APPENDIX B

Lead Paint Sample Analytical Results

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PARAGON ANALYTICS

225 Commerce Drive ♦ Fort Collins, CO 80524 ♦ (800) 443-1511 ♦ (970) 490-1511 ♦ FAX (970) 490-1522

January 29, 2008

Mr. Jon De'Ath
BMT-Entech, Inc.
13755 Sunrise Valley Drive, Suite 320
Herndon, VA 20171

Re: Paragon Workorder: 08-01-166
Client Project Name: Light House Sampling Project
Client Project Number: 0416-8-50

Dear Mr. De'Ath:

Eleven solid samples were received from BMT-Entech, Incorporated on January 18, 2008.
The samples were scheduled for Total Metals (pages 1-119) analysis.

The results for this analysis are contained in the enclosed reports.

Thank you for your confidence in Paragon Analytics. Should you have any questions, please call.

Sincerely,

Paragon Analytics
Debbie Fazio
Project Manager

DJF/jb
Enclosure: Report & CD

A Division Of DataChem Laboratories, Inc.

Chain of Custody Form

0801166

Page 1 of 1

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Project Manager:

STEVE BAKER

Project Name:

LIGHT HOUSE SAMPLING PROJECT

Job No:

0416-B-50

Samplers:

STEVE BAKER

Requested Analyses

Laboratory Name:

PARAGON ANALYTICS, Inc.

Address:

225 Commerce Drive

Fort Collins, Colorado

Contact:

D. FAZIO

Phone No.

970 490-1511

Shipping Method:

DHL EXPRESS

Observations, Comments, Special Instructions, QC

Sample ID	'08 Date	Time	Matrix	Preservative	Sample Type	VOCs	SVOCs	OC Pesticides	PCBs	Total Metals by ICP	Dissolved Metals by ICP	Herbicides	OP Pesticides	TPH	TCLP Organics SW1311	TCLP Metals SW1311	pH	Gross Alpha / Beta	Tritium	Radium 226	Radium 228	Solids	No. of Containers
LH-Pb Paint - 1	1/16	0914	PAINT	NA	N					X													1
LH-Pb Paint - 2		0915								X													1
LH-Pb Paint - 3		0918								X													1
LH-Pb Paint - 4		0920								X													1
LH-Pb Paint - 5		0930								X													1
LH-Pb Paint - 6		0935								X													1
LH-Pb Paint - 7		0937								X													1
LH-Pb Paint - 8		0945								X													1
LH-Pb Paint - 9		1000								X													1
LH-Pb Paint - 10		1005								X													1
LH-Pb Paint - 11		1010								X													1
(Sample Type: N, FDUP, MS/MSD, TB, EB, wipe)						(Matrix: SS, S, GW, SW, SED, WQ, sludge)						Total										11	

Relinquished by:	Date:	Received by:	Date:	Relinquished by:	Date:	Received by:	Date:
Signature: <i>Steve Baker</i>	1/16/08	Signature: <i>Sheri Lafferty</i>	1/18/08	Signature:		Signature:	
Printed Name: Steve Baker	Time: 1600	Printed Name: Sheri Lafferty	Time: 1115	Printed Name:		Printed Name:	
Company: BMT Entech, Inc.		Company: Paragon		Company:		Company:	

White: Laboratory

Pink: Project File

Yellow: QA Manager

Goldenrod: Field Operations Manager

Total LEAD

Method SW6010

Sample Results

Lab Name: Paragon Analytics

Client Name: BMT-Entech, Inc.

Client Project ID: Light House Sampling Project 0416-8-50

Work Order Number: 0801166

Final Volume: 100 ml

Reporting Basis: As Received

Matrix: SOLID

Result Units: mg/kg

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	MDL	Flag	Sample Aliquot
LH-PbPAINT-1	0801166-1	1/16/2008	1/22/2008	01/23/2008	N/A	500	80000	150	99		1.01 g
LH-PbPAINT-2	0801166-2	1/16/2008	1/22/2008	01/23/2008	N/A	500	1700	150	98		1.02 g
LH-PbPAINT-3	0801166-3	1/16/2008	1/22/2008	01/23/2008	N/A	500	71000	150	98		1.02 g
LH-PbPAINT-4	0801166-4	1/16/2008	1/22/2008	01/23/2008	N/A	500	80000	150	99		1.01 g
LH-PbPAINT-5	0801166-5	1/16/2008	1/22/2008	01/23/2008	N/A	500	78000	150	100		1 g
LH-PbPAINT-6	0801166-6	1/16/2008	1/22/2008	01/23/2008	N/A	500	70000	150	98		1.02 g
LH-PbPAINT-7	0801166-7	1/16/2008	1/22/2008	01/23/2008	N/A	500	79000	150	98		1.02 g
LH-PbPAINT-8	0801166-8	1/16/2008	1/22/2008	01/23/2008	N/A	500	5400	150	100		1 g
LH-PbPAINT-9	0801166-9	1/16/2008	1/22/2008	01/23/2008	N/A	500	85000	150	98		1.02 g
LH-PbPAINT-10	0801166-10	1/16/2008	1/22/2008	01/23/2008	N/A	500	91000	140	96		1.04 g
LH-PbPAINT-11	0801166-11	1/16/2008	1/22/2008	01/23/2008	N/A	500	82000	150	98		1.02 g

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: IT0801166-1

Date Printed: Monday, January 28, 2008

Paragon Analytics

Page 1 of 1

LIMS Version: 6.110A

APPENDIX C

ACM Sample Analytical Results

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1/23/08
Page 1 of 4


SUBMITTED TO:

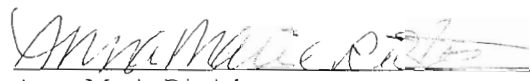
Steve Baker
BMT Entech
13755 Sunrise Valley Drive, Suite 320
Herndon, VA 20171

REFERENCE DATA:

Client Sample No.:	LH-ACM-1 through LH-ACM-9
P.O. No.:	Not Available
Sample Location:	Light House Sampling Project; Job No.: 0416-8-50
Sample Type:	Bulk
Method Reference:	EPA-600/R-93/116
DCL Set ID No.:	08-A-0239
DCL Sample ID No.:	08-01386 through 08-01394
Sample Receipt Date:	1/18/08
Analysis Date:	1/22/08 through 1/23/08

We certify that the following samples were prepared and analyzed by Polarized Light Microscopy for asbestos and other fibrous constituents using EPA-600/R-93/116. The samples were acceptable upon receipt except where noted. The samples were examined under a stereomicroscope in a laboratory fume hood for general composition and phase separation. If needed, portions of the sample were removed and ground with a mortar and pestle before being mounted on a glass microscope slide. Mountings of representative portions of the material are prepared in one or more appropriate refractive index liquids (1.550, 1.605, 1.680) and examined by Polarized Light Microscopy*. Estimates of concentration are made on an area basis. The results of the analysis apply only to the materials analyzed and are summarized on the attached bulk asbestos analysis data sheets. DataChem Laboratories will dispose of all bulk samples after 60 days unless other arrangements are made.


Shawn Smythe
Analyst


Anna Marie Ristich
Reviewer

*Floor tiles, decorative paints, joint compounds, and cement materials require additional treatment in order to evaluate the concentration of small asbestos fibers bound in the material. Some samples may contain fibers that are not visible by PLM and can only be detected by electron microscopy techniques. Floor tiles are analyzed as homogeneous materials if insufficient mastic is present or if phases have been cross contaminated.

DataChem Laboratories NVLAP Lab ID: 101917. Laboratory accreditation by the National Institute of Standards and Technology does not in any way constitute approval or endorsement by NVLAP, NIST, or any agency of the federal government..

CINCINNATI OFFICE
4388 GLENDALE-MILFORD ROAD
CINCINNATI, OHIO 45242-3706
513 733-5336, FAX 513 733-5347

WEST COAST OFFICE
11 SANTA YORMA COURT
NOVATO, CALIFORNIA 94945
800 280-8071, FAX 415 893-9469

DataChem Laboratories
Polarized Light Microscopy
Asbestos Analytical Report

Client: BMT Entech
Location: Light House Sampling Project; Job No.: 0416-8-50
Set ID: 08-A-0239

Client Sample ID:	LH-ACM-1	LH-ACM-1	LH-ACM-2	LH-ACM-2	LH-ACM-3
DCL Sample ID:	08-01386A	08-01386B	08-01387A	08-01387B	08-01388
Macroscopic Examination					
Accepted/Rejected:	Accepted	Accepted	Accepted	Accepted	Accepted
Homogeneity:	Layered	Layered	Layered	Layered	Layered
Color:	Black	Black	Red	Black	Inseparable
Texture:	Compact	Resinous	Compact	Fbrs/Resns	Yellow/Grey
Description:	Tile	Mastic	Tile	Mastic	Fbrs/Flex
Analysis:	PLM	PLM	PLM	PLM	Material
Asbestiform Minerals					
% Chrysotile:	>1 ≤ 3	>3 ≤ 5	>1 ≤ 3	>1 ≤ 3	
% Amosite:					
% Crocidolite:					
% Tremolite - Actinolite:					
% Anthophyllite:					
% Total Asbestos:	>1 ≤ 3	>3 ≤ 5	>1 ≤ 3	>1 ≤ 3	ND
Other Materials					
% Cellulose:		>1 ≤ 3		>50 ≤ 60	
% Fiberglass:					>80 ≤ 90
% Other Fibers:					
% Resin/Binder:	>10 ≤ 20	>70 ≤ 80	>10 ≤ 20	>20 ≤ 30	>3 ≤ 5
% Non Fibrous:	>70 ≤ 80	>10 ≤ 20	>70 ≤ 80	>5 ≤ 10	>5 ≤ 10

ND = None Detected Trace = <1%

Special Prep Procedures: None.

*Notes: P. O. #: Not Available.



Shawn Smythe
Microscopist

All values are in area percent by visual estimate. The Federal Register Vol. 55 No. 224 Tuesday Nov. 20 1990 Rules and Regulations states "... If the asbestos content is estimated to be less than 10% by a method other than point counting,... (the analysis) be repeated using the point counting technique by PLM." Any of the above samples can be reanalyzed by point counting at the client's request. Wherever possible, separate phases are analyzed and reported individually.

1/23/08

DataChem Laboratories
Polarized Light Microscopy
Asbestos Analytical Report

Client: BMT Entech
Location: Light House Sampling Project; Job No.: 0416-8-50
Set ID: 08-A-0239

Client Sample ID:	LH-ACM-4	LH-ACM-5	LH-ACM-5	LH-ACM-6	LH-ACM-6
DCL Sample ID:	08-01389	08-01390A	08-01390B	08-01391A	08-01391B
Macroscopic Examination					
Accepted/Rejected:	Accepted	Accepted	Accepted	Accepted	Accepted
Homogeneity:	Layered	Layered	Layered	Layered	Layered
	Inseparable				
Color:	Grey/Tan	Green	Tan	Grey	Grey
Texture:	Crumbly/Fibrous	Compact	Resinous	Crumbly	Crumbly
Description:	Drywall	Tile	Mastic	Plaster	Skimcoat
Analysis:	PLM	PLM	PLM	PLM	PLM
Asbestiform Minerals					
% Chrysotile:		>1 ≤ 3		Trace	
% Amosite:					
% Crocidolite:					
% Tremolite - Actinolite:					
% Anthophyllite:					
% Total Asbestos:	ND	>1 ≤ 3	ND	Trace	ND
Other Materials					
% Cellulose:	>10 ≤ 20		>5 ≤ 10		
% Fiberglass:					
% Other Fibers:					
% Resin/Binder:		>10 ≤ 20	>60 ≤ 70		
% Non Fibrous:	>70 ≤ 80	>70 ≤ 80	>10 ≤ 20	>90 ≤ 100	>90 ≤ 100

ND = None Detected Trace = <1%

Special Prep Procedures: None.

*Notes: P. O. #: Not Available.



Shawn Smythe
Microscopist

All values are in area percent by visual estimate. The Federal Register Vol. 55 No. 224 Tuesday Nov. 20 1990 Rules and Regulations states "... If the asbestos content is estimated to be less than 10% by a method other than point counting,... (the analysis) be repeated using the point counting technique by PLM." Any of the above samples can be reanalyzed by point counting at the client's request. Wherever possible, separate phases are analyzed and reported individually.

1/23/08

DataChem Laboratories
Polarized Light Microscopy
Asbestos Analytical Report

Client: BMT Entech
Location: Light House Sampling Project; Job No.: 0416-8-50
Set ID: 08-A-0239

Client Sample ID:	LH-ACM-7	LH-ACM-8	LH-ACM-9
DCL Sample ID:	08-01392	08-01393	08-01394
Macroscopic Examination			
Accepted/Rejected:	Accepted	Accepted	Accepted
Homogeneity:	Homog.	Homog.	Homog.
Color:	Tan	Grey	Grey
Texture:	Fibrous	Fibrous	Cmpt/Fbrs
Description:	Ceiling Tile	Material	Transite
Analysis:	PLM	PLM	PLM
Asbestiform Minerals			
% Chrysotile:		>40 ≤ 50	>10 ≤ 20
% Amosite:			
% Crocidolite:			
% Tremolite - Actinolite:			
% Anthophyllite:			
% Total Asbestos:	ND	>40 ≤ 50	>10 ≤ 20
Other Materials			
% Cellulose:	>80 ≤ 90		
% Fiberglass:			
% Other Fibers:		>30 ≤ 40	
% Resin/Binder:			
% Non Fibrous:	>5 ≤ 10	>5 ≤ 10	>70 ≤ 80

ND = None Detected Trace = <1%

Special Prep Procedures: None.

*Notes: P. O. #: Not Available.



Shawn Smythe
Microscopist

All values are in area percent by visual estimate. The Federal Register Vol. 55 No. 224 Tuesday Nov. 20 1990 Rules and Regulations states "... If the asbestos content is estimated to be less than 10% by a method other than point counting,... (the analysis) be repeated using the point counting technique by PLM." Any of the above samples can be reanalyzed by point counting at the client's request. Wherever possible, separate phases are analyzed and reported individually.

Page 1 of 1



fax +1 703.793.3976

Samplers:

08-A-0259
ive, Suite 320

STEVE BAKER

LIGHT HOUSE SAMPLING PROJECT

0416-8-50

Steve Bann

Labratory Name:

DATAchem LABS

Address:

4388 GURINDALE -

MILFORD ROAD, CINCINNATI

Contact:

J. BAXTER

Phone No. _____

(Enc) 458-1493

Shipping Method:

DHL EXPRESS

08	Observations, Comments, Special Instructions, QC
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01386

0138 7

01388

01388

01340

0139

$$\begin{array}{r} 0139 \\ \hline 0139 \end{array}$$

0137
0138

0157

[illegible]

Total

Company

1000

Company _____

100

Company

100%

Company

—

APPENDIX D

**Survey Photographs
January 16, 2008**

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PHOTO LOG



Photo 1: Pronounced ceiling damage and peeling paint were found in the Kitchen. Damage was presumably due to past roof leakage. Pb Sample #1 was collected from this location.



Photo 2: Peeling white paint appeared prominently around every window in the Lighthouse. Pb Sample #2 was collected from this first floor, "Living Room" location.

PHOTO LOG



Photo 3: Dramatic peeling of wall paint was noted in the entry hall. Some damage to ceiling plaster was also apparent. Multiple layers of distinctly different colors of paint were noted in the sample collected for analysis. Pb Sample #3 was collected from this particular wall.



Photo 4: Dramatic peels of paint were also observed in the first floor Supply Pantry. Pb Sample #4 was collected from this wall because of its unique color.

PHOTO LOG



Photo 5: A unique color of blue wall paint was noted in Kitchen between the former drop/false ceiling (removed) and the original plaster ceiling. Pb Sample #5 was collected from this location.



Photo 6: An example of the blue-green wall paint found in the second story East Bedroom. This color of paint was presumed to be behind most wall panels. The paint's overall condition was superior to that of similar blue-green painted surfaces in other, unprotected areas of the Lighthouse. Pb Sample #6 was collected from this locale.

PHOTO LOG



Photo 7: Baseboards were painted black in the hall and stair areas of the Lighthouse. This was the only instance where black paint was noted in the structure. Pb Sample #7 was collected in from a section of the second story baseboard.



Photo 8: Yet another unique blue painted surface, visually similar in tone and color to that used on PIADC's ferry fleet. This example was found only in the South Bedroom on the second floor. Pb Sample #8 was collected from the entry door frame.

PHOTO LOG



Photo 9: Peeling white paint was observed on all of the board plank walls in the Service Room. Pb Sample #9 was collected from the vicinity of the window and was determined to be representative of the room's entire painted surface.



Photo 10: Heavy corrosion and peeling paint in the bell-shaped roof of the Lantern Room. Pb Sample #10 was collected from this west-facing roof panel.

PHOTO LOG



Photo 11: Example of the grey paint used on all upper story stairwell handrails and stair treads. Pb Sample #11 was collected from the stairs leading from the second floor to the Attic. Photo 11 above shows the access stairs between the Service Room to the Lantern Room.



Photo 12: Typical example of the black 9x9-inch floor tiles commonly found throughout the Lighthouse. ACM Sample #1 was collected from this landing area between the second floor and the Attic. Both the tile and the underlying mastic were evaluated for asbestos content.

PHOTO LOG



Photo 13: Example of the red, 9x9-inch tiles found in the second floor Office. This was the only room observed to have red tiles. ACM Sample #2 was collected from the broke tile section shown above. Both the tile and mastic were examined for asbestos. The adjacent drop/false ceiling tiles were also evaluated as potential ACM items.



Photo 14: A detailed view of a typical drop/false ceiling panel. The white, outer layer was made of a soft, pliable plastic material. The insulation materials (pink/orange) was tested and identified as fiberglass. ACM Sample #3 was collected from the second floor Office panel pictured above.

PHOTO LOG



Photo 15: A sample of ceiling plaster was obtained for ACM analysis from the East Bedroom, on the second floor. Small fibers were visible in the sample (ACM Sample #4).



Photo 16: Example of broken lathe and plaster in the stairwell between the first and second floor. A plaster sample (ACM Sample #6) containing small fibers was collected from this location. As shown in this image, no insulation was observed between walls or floors in any areas where damage permitted visual inspection of interstitial spaces.

PHOTO LOG



Photo 17: Example of acoustic ceiling tiles (white) glued to original lathe and plaster surface. ACM Sample #7 was collected from one of these tiles and was found to be made of cellulose. The partially intact drop/false ceiling system also seen in this image was installed sometime after the acoustic tiles. These drop/false ceiling tiles were primarily composed of fiberglass.



Photo 18: View of the hot water heating system and asbestos-wrapped water pipes in the Basement. The pipe insulation was sampled (ACM Sample #8) for confirmation purposes. All of this insulation was significantly deteriorated and should be removed in the near term before it completely disintegrates. Pipe insulation was observed throughout the Basement.

PHOTO LOG



Photo 19: The roof of the Lighthouse (and kitchen at rear- partly visible) is covered with transite shingles. A broken piece of shingle picked from the ground in the vicinity of the enclosed porch (white lean-to structure). Laboratory analysis revealed substantial asbestos content in the shingle material. This sample was identified as ACM Sample #9. Roofing on the enclosed porch may not be transite based on its general, visual appearance.

